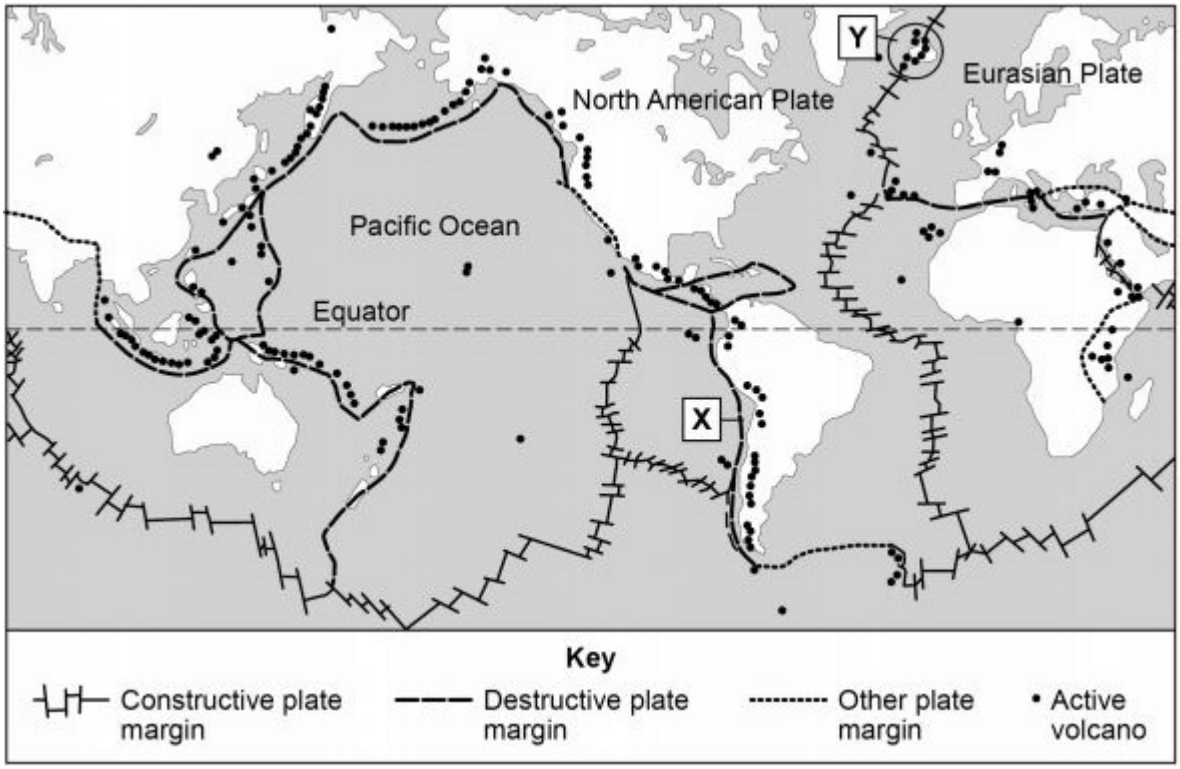
1. Explain how living in areas that are at risk from a tectonic hazard(s) may have both advantages and disadvantages.

(Total 6 marks)

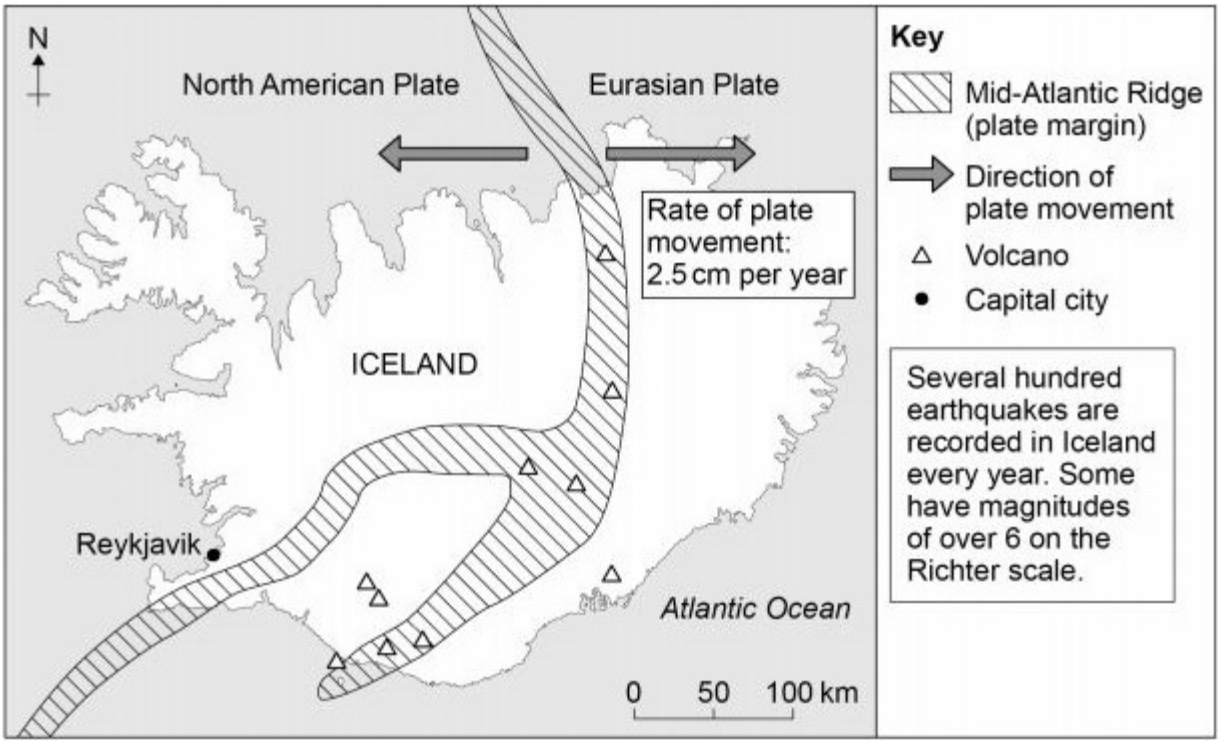
2. Study **Figure 1**, a world map showing plate margins and active volcanoes.

Figure 1



Study **Figure 2** the map of Iceland showing the tectonic plates. The area is labelled Y on **Figure 1**.

Figure 2



(a) Using **Figure 2**, how long will it take for the plates to move 100 metres?

Shade **one** circle only.

A 80 years ⬭

B 250 years ⬭

C 1200 years ⬭

D 4000 years ⬭

(1)

(b) Using **Figure 2** above and your own understanding, suggest how plate movements cause tectonic hazards in Iceland.

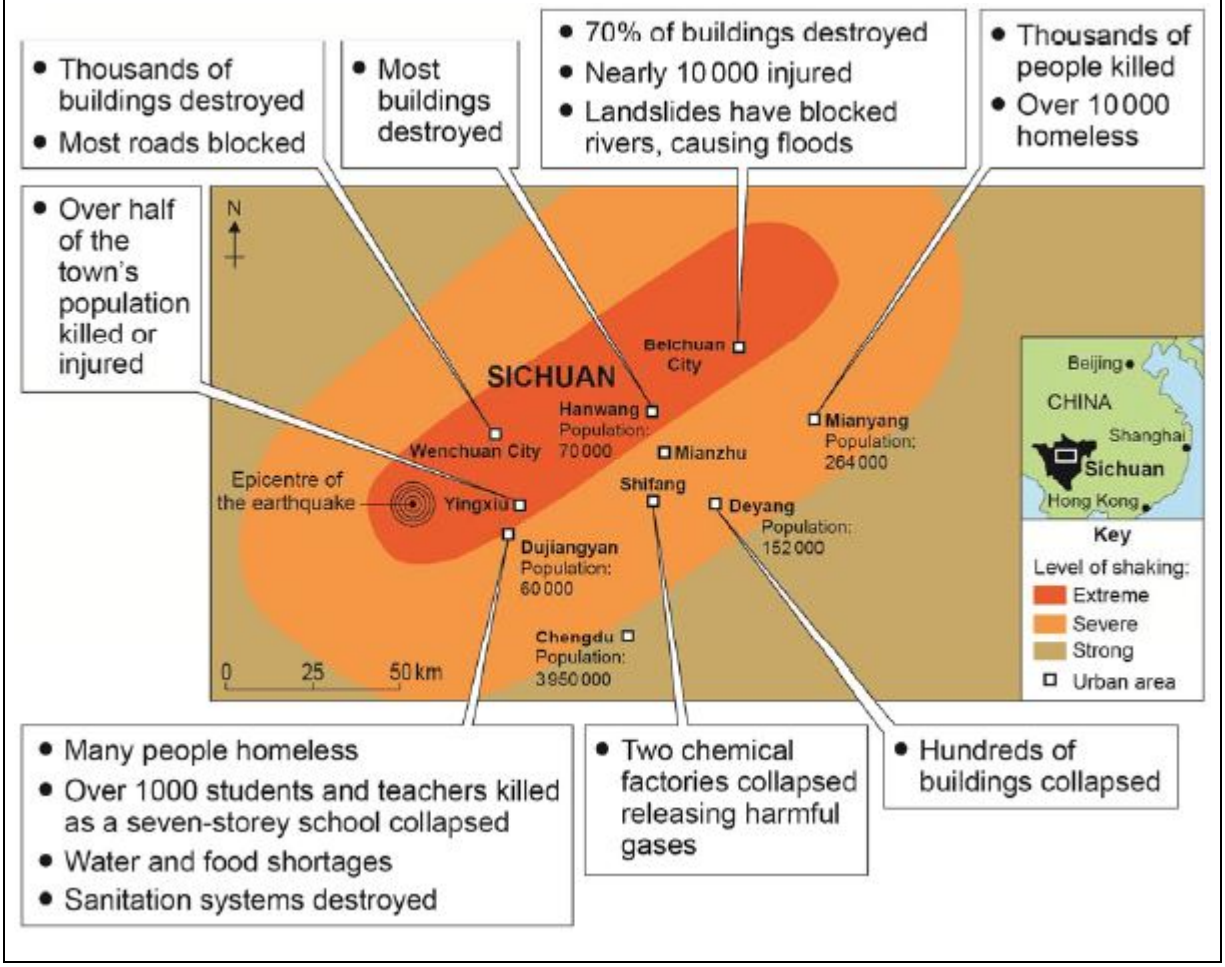
(6)

(Total 7 marks)

3. Study the figure, information about an earthquake in China in 2008.

One of the most powerful earthquakes ever experienced in China has hit the province of Sichuan. The earthquake has destroyed large areas of towns and cities. Roads and railways have been damaged. Water and electricity supplies have been affected in many cities. The earthquake has caused a number of landslides. Shaking was felt 1500 km away in the capital city of Beijing, where several buildings were evacuated because of fear of collapse.

Damage in Beichuan City



(a) Using the figure, which **two** of the following natural hazards were caused by the earthquake in China?

Shade **two** circles only.

A Wildfires ⬭

B Landslides ⬭

C Volcanoes ⬭

D Tsunamis ⬭

E Floods ⬭

(2)

(b) Using the figure and your own knowledge, suggest why the effects of a tectonic hazard vary between areas of contrasting levels of wealth.

(6)

(Total 8 marks)

4. Explain how planning can reduce the effects of natural hazards in urban areas.

(Total 6 marks)

5. The figure below describes natural hazards in urban areas in less developed countries.

EARTHQUAKE FLATTENS CAIRO SLUMS

There was a powerful earthquake in the Egyptian city of Cairo yesterday. Hundreds of people died and thousands of people were injured. The modern, high-rise buildings next to the River Nile were not affected. However, many of the poorer slum areas were badly damaged. In these areas the poorly built, illegal homes collapsed, trapping people under rubble.

LANDSLIDES DESTROY PARTS OF RIO DE JANEIRO

After days of heavy rainfall, flooding and landslides have caused devastation in parts of Rio de Janeiro, one of the largest cities in Brazil. In one area a block of flats fell down when floodwater washed away the foundations.

Many poor people live in slums built on steep hillsides. The rainfall caused landslides on many of these slopes. Thousands of tons of mud and rocks flowed down hillsides, burying everything.

Over a hundred people were killed and thousands of people were made homeless because of the floods.

(i) Suggest **two** reasons why large numbers of people are at risk from natural hazards in urban areas.

Use the figure above to help you.

(4)

(ii) Describe the problems that natural hazards cause in urban areas.

Use the figure above and your own knowledge.

(6)

(iii) Explain how the effects of natural hazards in urban areas can be reduced.

Use an example(s) you have studied.

(6)

(Total 16 marks)

6. Explain the causes of **either** earthquakes **or** volcanic eruptions.

Use an example(s) from an area that you have studied.

(Total 6 marks)

7. To what extent do the effects of a tectonic hazard vary between areas of contrasting wealth?

Use **one or more** named examples in your answer.

(Total 9 marks)
(+ 3 SPaG marks)

8. Study **Figure A**, a photograph showing an area affected by an earthquake in 2010, and **Figure B**, a photograph showing an area affected by a volcanic eruption in 2006.

Figure A

Figure B

Choose either an earthquake **or** a volcanic eruption.

Assess the extent to which primary effects are more significant than secondary effects.

Use **Figure A** or **Figure B** and an example you have studied.

(Total 9 marks)
(+ 3 SPaG marks)

9. Study the photographs showing the different types of response to a tectonic hazard.

Immediate response to a tectonic hazard in Haiti

Long-term response to a tectonic hazard in Haiti

‘Long-term responses to a tectonic hazard are more important than immediate responses.’

Do you agree?

Using the photographs above and **one or more** examples, explain your answer.

(Total 9 marks)
(+3 SPaG marks)

Mark schemes

1.

Level	Marks	Description
3 (Detailed)	5 – 6	AO1 Demonstrates detailed knowledge of the advantages and disadvantages of living in areas at risk from tectonic hazards. AO2 Shows thorough geographical understanding of how tectonic hazards create both advantages and disadvantages for people.
2 (Clear)	3 – 4	AO1 Demonstrates reasonable knowledge of the advantages **and/or** disadvantages of living in areas at risk from tectonic hazards. AO2 Shows clear geographical understanding of how tectonic hazards create advantages **and/or** disadvantages for people.
1 (Basic)	1 – 2	AO1 Demonstrates basic knowledge of the advantage(s) **and/or** disadvantage(s) of living in areas at risk from tectonic hazards. AO2 Demonstrates limited understanding of how tectonic hazards create advantage(s) **and/or** disadvantage(s) for people.
	0	No relevant content.

- **Level 3 (detailed)** responses will be developed. Some geographical terms will be applied. All aspects of the question are answered, including both advantages and disadvantages, although the two aspects may not be balanced.
- **Level 2 (clear)** responses are likely to have linked or elaborated statements and some use of geographical terms. May cover advantages or disadvantages only.
- **Level 1 (basic)** responses may comprise simple/partially inaccurate statements with very limited subject vocabulary. Partial sequence or random points made. May be limited to a single advantage **and/or** disadvantage.
- Max Level 1 if referring to a natural hazard that is not tectonic.

Indicative content

The command word is “explain”, so responses should provide a reasoned account of how and why tectonic hazards create advantages and disadvantages for people.

Advantages of living in areas at risk from volcanic hazards.

- In volcanic areas geothermal energy can be harnessed by using steam from underground heated by magma.
- Geothermal power stations produce electricity e.g. Iceland and New Zealand.
- Volcanoes, including hot springs and geysers, attract tourists. This creates employment and may have a multiplier effect.
- Magma and lava may contain minerals including gold, silver, diamonds, copper and zinc. Basalt can be used in construction and to build roads.
- Weathered lava may form nutrient rich soil which can be cultivated to produce crops and rich harvests.
- New land may be created following a volcanic eruption.
- People believe the chances of the volcano erupting are very slim. Poor people, especially in LICs cannot afford to live away from volcanoes as they provide jobs, and their families and friends live there. Some places are well prepared for volcanic hazards so people feel safe.

Advantages of living in areas at risk from seismic hazards

- Plate margins often coincide with favourable areas for settlement, such as coastal areas where ports are developed. Large settlements in seismic zones offer job opportunities, such as San Francisco and Los Angeles.
- Perception that risk is outweighed by economic or social opportunities.
- Engineering can make people feel safe e.g. Buildings can constructed to be earthquake proof. Protection, planning and monitoring may be advanced, so potential risks are reduced.
- Fault lines associated with earthquakes can allow water supplies to reach the surface.

Disadvantages of living in areas at risk from volcanic hazards.

- Volcanic eruptions can kill people and damage property.
- Economic activity can suffer as it is hard for businesses to operate after an eruption.
- Habitats and landscapes are damaged by lava flows.
- Ash disperses in the air, and together with volcanic gases can affect breathing. It may cover the land, including fields, houses, roads, and industrial plants.
- Pyroclastic flows can destroy houses and trees.

  Eruptions may trigger tsunamis, which lead to destructive flooding of the coastline.

Disadvantages of living in areas at risk from seismic hazards.

- In seismic areas ground shaking causes bridges and buildings to collapse, windows to shatter, power lines to collapse, water/gas mains and sewers to fracture.
- Immediate deaths and injuries result from crushing, falling glass, fire and transport accidents.
- People become homeless.
- Slope failures set off avalanches.
- There may be panic, fear and hunger.
- Longer term disadvantages include diseases spread from polluted water, civil disorder, looting, power cuts, reduced emergency services, unemployment, disability, loss of farmland and food production.
- Credit knowledge of specific volcanic areas and earthquake zones, although this is not essential for access to Level 3. e.g. Naples area in Italy has olives, vines, nuts and fruit (mainly oranges and lemons) growing on volcanic soils close to Mount Vesuvius. In Iceland, volcanoes provide cheap geothermal power, 28% of all its energy, including heating of pavements in winter in Reykjavik. The Blue Lagoon in Iceland is heated by geothermal heat, with 1.5 million visitors per year

AO1 – 3 marks
AO2 – 3 marks

[6]

2. One mark for the correct answer:

(a) D 4000 years.

No credit if two or more answers are circled

AO4 = 1

(b)

Level	Marks	Description
3 (Detailed)	5 – 6	AO2 Shows thorough geographical understanding of processes causing tectonic hazards. AO3 Demonstrates coherent application of knowledge and understanding in analysing why tectonic activity occurs in Iceland.
2 (Clear)	3 – 4	AO2 Shows some geographical understanding of the processes causing tectonic hazard(s). AO3 Demonstrates reasonable application of knowledge and understanding in analysing why tectonic activity occurs in Iceland.
1 (Basic)	1 – 2	AO2 Shows limited geographical understanding of the processes causing tectonic hazard(s). AO3 Demonstrates limited application of knowledge and understanding in analysing why tectonic activity occurs in Iceland.
	0	No relevant content.

- **Level 3** (detailed) responses will be developed. Some geographical terms will be applied.
- **Level 2** (clear) responses are likely to have linked or elaborated statements and some use of geographical terms.
- **Level 1** (basic) responses may comprise simple / partially inaccurate statements with very limited subject vocabulary. Partial sequence or random points made.

Indicative content

- The command word is “suggest” so responses should set out the likely causes of volcanoes and earthquakes from the source provided, showing an understanding of the processes involved and the hazards.
- Accept explanations that refer to ridge push and slab pull processes.
- The more likely explanation is movement of plates and subduction caused by convection currents.
- Understanding of processes causing volcanic activity at margins. Two plates move apart. Magma rises through the crust, and some can erupt producing volcanoes.
- Understanding of earthquakes at margins as plates move apart. Faults are formed at the margin and earthquakes can occur here. They are usually of low magnitude, although some can be high as stated in the source. Some may be linked to volcanic activity. Most happen at shallow depths below the surface where the plates are moving apart.
- Hazards include huge amounts of volcanic ash; glacial floods caused by heat from volcanic activity, lava flows, mudflows (lahars). Earth tremors and quakes can cause sudden movement of the land.
- Credit focus on hazards as events affecting people e.g. indirect hazards such as famine due to crop damage
- Credit knowledge and understanding of specific events, such as the eruption under Eyjafjallajökull in 2010.
- Application of knowledge and understanding to **Figure 1**. Iceland lies on the plate margin. Molten lava from beneath the Earth´s crust wells up, and is pushed away from the ridge at a rate of 2.5 cm per year. Volcanoes are mostly confined to the ridge in a linear belt where 2 plates are separating.
- Max L1 for explanation of tectonic activity at destructive or conservative margins.
- Top L2 for explanation of one hazard only. Note however that volcanoes (and earthquakes) may be associated with more than one hazard.
- Max 1 mark for description of pattern in isolation.
- There should be some (implied) reference to **Figure 1** to access Level 3.

AO2 = 3
AO3 = 3

[7]

3. (a) Landslides and Floods (2 × 1 marks)

AO4 = 2

(b)

Level	Marks	Description
3 (Detailed)	5 – 6	AO3 Demonstrates thorough application of knowledge and understanding to analyse geographical information, giving detailed explanation of the links between effects and wealth. AO3 Analyses evidence from the figure to support the response.
2 (Clear)	3 – 4	AO1 Demonstrates specific and clear knowledge of the effects of a tectonic activity in relation to wealth of a country. AO2 Demonstrates clear geographical understanding of the interrelationship between the effects of a tectonic activity and relative wealth of a country.
1 (Basic)	1 – 2	AO1 Shows some knowledge of the effects of a tectonic activity in relation to wealth of a country. AO2 Shows limited geographical understanding of the link between effects of a tectonic activity and relative wealth of a country.
	0	No relevant content.

Indicative content

- Effects can relate to any type of tectonic activity.
- Effects can be considered in socio-economic and environmental terms.
- Effects can be primary and secondary.
- Answers may simply agree with the premise that wealth gives better opportunities for prediction, preparation and planning or may look at individual aspects within these categories.
- Students may reflect on ‘recovery times’ linked to levels of wealth.
- A broader discussion may consider that while wealth is an important factor there may be other considerations.

AO1 = 2
AO2 = 2
AO3 = 2

[8]

4. *This mark scheme is from a question paper that assessed a previous specification and has not been edited.*

Click [here] to access a document explaining the differences that might apply to it.

Reference to any appropriate natural hazard acceptable.

One hazard/range of hazards/one key idea (buildings etc) acceptable.

Level 1 Basic (1–2 marks)

Basic points which include generic ideas (warn people/build barriers/tell people what to do). Largely descriptive.

Barriers can be built near rivers and people told when flooding likely.

Level 2 Clear (3–4 marks)

Clearer appreciation of planning with some explanation (earthquake – proof building/earthquake training days/emergency kits etc).

Putting barriers alongside rivers would mean that if river levels increased areas would not flood. Also floodwater could be diverted away from the areas which are most at risk. If fewer buildings were built near rivers risk would be reduced.

Level 3 Detailed (5–6 marks)

Detailed explanation which identifies a range of ideas which would reduce the effects of natural hazards.

Rivers can be managed by using barriers or widening rivers so that they can hold more water. Diverting flood water into holding ponds would reduce flooding. Planning strategies that did not allow building on riversides would reduce the threat of flooding and allow rivers to expand without causing problems.

[6]

5. *This mark scheme is from a question paper that assessed a previous specification and has not been edited.*

Click [here] to access a document explaining the differences that might apply to it.

(i) Any two reasons (2 × 2)

1 mark basic point, 2nd mark, some explanation/development.
– more people in urban areas (1)
– more people living in hazardous areas (1)
– change to urban areas increases hazard risk (1) because of building in vulnerable areas (1)
– increasing numbers of hazards (1)
– shortage of building space (1) means increasing use of vulnerable areas (1)
– poorly constructed housing (1) cannot stand up to natural hazards (1)
– people may be made homeless (1) and this could lead to health problems (1)

4

(ii) Own knowledge implies knowledge of ideas or place.

Level 1 Basic (1–2 marks)
Basic ideas largely taken from resource with limited development.
Natural hazards like earthquakes can damage buildings and kill or injure people, especially if they live in poor areas.

Level 2 Clear (3–4 marks)
Clear idea which uses resource and brings in additional points. Wider ideas (generic or place based).
Hazards can damage buildings and ruin people's homes, especially in poor areas. People can lose everything or be hurt or even killed. In urban areas roads and railway lines can be destroyed and secondary hazards like fires, like after the Kobe earthquake, can devastate areas.

Level 3 Detailed (5–6 marks)
Detailed understanding which uses resources and brings in additional detail, exemplification. (Short/long term ideas / links to broader economy / infrastructure etc).
Because a lot of people live in a small area hazards can be devastating in urban areas. In poor countries like Egypt people can be killed and many homes are destroyed. Poorer people often lose everything and are affected by secondary problems like disease because water supplies are affected. Large scale hazards can disrupt transport and business, the Kobe earthquake in Japan caused the major highways and railway lines to be destroyed and thousands of people lost their jobs as factories were destroyed.

6

(iii) **Level 1 Basic (1–2 marks)**
Basic points with limited development and no real exemplification.
Risks can be reduced by building stronger houses and making sure people are prepared.

Level 2 Clear (3–4 marks)
Clear understanding of the idea. Ideas developed and some exemplification.
In some urban areas like Kobe and San Francisco earthquake proof buildings are built and people are educated about what to do if an earthquake strikes. Even in poor areas buildings can be built with cross-bracing so they don't collapse. Emergency services can also be trained to deal with hazards.

Level 3 Detailed (5–6 marks)
Detailed understanding with locational exemplification.
In Japan earthquake practice days are held and in San Francisco people are told what to do in the event of an earthquake and encouraged to have an emergency kit. Planning can help to ensure that buildings are not constructed in areas probe to flooding and landslides and buildings can be built to reduce risks from earthquakes and flooding. In many urban areas there are water channels which take flood water away from built up areas and in places like Dhaka there are flood embankments. London as the Thames Flood Barrier.

6

[16]

6. *This mark scheme is from a question paper that assessed a previous specification and has not been edited.*

Click [here] to access a document explaining the differences that might apply to it.

Level 1 Basic (1 –2 marks)
Gives a basic idea of plate movement. Elaboration is very limited.
E.g. *plates moving towards each other. One plate pushed below another. As plates move there are shock waves.*
Knowledge of basic information.
Simple understanding.
Few links; limited detail; uses a limited range of specialist terms.
Limited evidence of sentence structure. Frequent spelling, punctuation and grammatical errors.

Level 2 Clear (3–4 marks)
Gives clear indication of process, linking statements.
E.g. *one plate subducted beneath another. As plates move, they snag and tension builds up. A sudden movement sends out shock waves, which causes earthquakes.*
Correct use of destructive, constructive, conservative, collision, divergent, convergent = L2.
Knowledge of accurate information.
Clear understanding.
Answers have some linkages; occasional detail/exemplar; uses some specialist terms where appropriate.
Clear evidence of sentence structure. Some spelling, punctuation and grammatical errors.

Level 3 Detailed (5–6 marks)
Detailed explanation and correct sequence of process. Case study example and clear process can access L3.
E.g. *Japan lies close to a destructive plate boundary. Here the Pacific/Philippine oceanic plate is subducted beneath the less dense Eurasian continental plate as convection currents in the mantle move the plates towards each other. As plates move, they snag and tension builds up, locking like a machine without oil. As the pressure builds up, it is suddenly released and causes a sudden movement that sends out shock waves, which causes earthquakes at the surface in Japan.*
Knowledge of accurate information appropriately contextualised and/or at correct scale.
Detailed understanding, supported by relevant evidence and exemplars.
Well organised, demonstrating detailed linkages and the interrelationships between factors.
Range of ideas in a logical form; uses a range of specialist terms where appropriate.
Well structured response with effective use of sentences. Few spelling, punctuation and grammatical errors.

6

7.

Level	Marks	Description
3 (Detailed)	7 – 9	AO1 Demonstrates detailed knowledge of the effects of a tectonic hazard and illustrates this through use of example(s). AO2 Shows thorough geographical understanding of how the effects may vary between areas of contrasting levels of wealth and illustrates this through use of example(s). AO3 Demonstrates application of knowledge and understanding in a coherent and reasoned way in evaluating the difference in effects between areas of contrasting levels of wealth.
2 (Clear)	4 – 6	AO1 Demonstrates clear knowledge of the effects of a tectonic hazard and may illustrate this through some use of example(s). AO2 Shows some geographical understanding of how the effects may vary between areas of contrasting levels of wealth and may illustrate this through some use of example(s). AO3 Demonstrates reasonable application of knowledge and understanding in evaluating the difference in effects between areas of contrasting levels of wealth.
1 (Basic)	1 – 3	AO1 Demonstrates limited knowledge of the effects of a tectonic hazard. AO2 Shows slight geographical understanding of how the effects may vary between areas of contrasting levels of wealth. AO3 Demonstrates limited application of knowledge and understanding in evaluating the difference in effects between areas of contrasting levels of wealth.
	0	No relevant content.

Level 3 (detailed) responses will be well developed and have accurate use of geographical terms. Reasoned examination of the extent to which the effects of a tectonic hazard vary between areas of contrasting levels of wealth with detailed use of example(s).

Level 2 (clear) responses will have linked or elaborated statements and some accurate use of geographical terms. Will outline the effects of a tectonic hazard. May start to make an evaluation of the extent to which the effects of a tectonic hazard vary between areas of contrasting levels of wealth. Likely to include some use of example(s).

Level 1 (basic) responses are likely to consist of simple statements, with limited use of subject vocabulary. Might be limited to generic statements. May be limited to discussing the effects of a tectonic hazard with limited evaluation of the extent to which the effects of a tectonic hazard vary between areas of contrasting levels of wealth. May lack any use of example(s) in support.

- Max Level 1 for effects of non-tectonic hazard such as tropical storms.
- Max Level 2 if answer does not refer to named example(s).
- No credit for responses to tectonic hazard unless linked to impacts.

Indicative content

- The command is ‘to what extent’, so the focus of the question is an evaluation of the degree to which the effects of a tectonic hazard vary between two areas of contrasting levels of wealth.
- The question only asks for one type of tectonic hazard which is most likely to be an earthquake or volcanic eruption. Tsunamis caused by tectonic activity are also valid. Credit only effects and not causes of the tectonic hazard.
- Answers are likely to refer to the effects of a tectonic hazard on two different areas of contrasting levels of wealth. This is likely to be but does not necessarily have to be a LIC/NEE v HIC.
- Tectonic hazards do not discriminate by wealth. However, discussion is likely to focus on how the effects may vary according to how well the country is able to predict, protect against and prepare for a tectonic hazard. This tends to be linked to wealth and is likely to be exemplified as such. There may also be some discussion about how wealthier countries tend to recover more quickly (therefore short v long term effects).
- Effects may be categorised into people and the environment//primary and secondary effects /social and economic effects.
- Social and economic effects may include: people being killed or injured, bereavement, homes being destroyed, transport and communication links not working, infrastructure destroyed, businesses damaged or destroyed, unemployment, looting and other crime, local economy disrupted, including manufacturing and tourism, reduced trade, longer term health effects, insurance claims, destruction of crops, loss of livestock (overlaps environmental effects) water pipes burst and water supplies contaminated (overlaps with environmental effects).
  May lead to disease risk.
- Environmental effects may include landslides, coastal flooding, disruption of ecosystems, sewage leaks and water pollution.
- Credit knowledge and understanding of specific examples of tectonic hazards. These might include L’Aquila earthquake 2009, Haiti earthquake 2010, Christchurch and Japanese Tohoku earthquakes 2011, Nepal earthquake 2015; Boxing day tsunami 2004, Japan tsunami 2011; Nyiragongo volcanic eruption, Congo 2002, Eyjafjallajökull eruption, Iceland 2010. Other tectonic examples are valid.
- The 6.3 magnitude L’Aquila earthquake in Italy in 2009 killed about 300 people and made over 60 000 homeless. In comparison, the more powerful 7.8 magnitude Gorkha earthquake in Nepal in 2015 is estimated to have killed over 8000 people and made more than 1 million homeless. Historic buildings, school and hospitals were destroyed in both quakes and access to food, water and electricity was reduced. Both areas suffered aftershocks triggering landslides and rockfalls. An avalanche swept through Everest Base camp in the Himalayas killing 19 tourists and Sherpas. In Italy, a mudflow was caused by a burst water pipe near Paganio. Responses to the two quakes varied considerably. A state of emergency was declared in both areas immediately after the quakes and international assistance was provided. Students might discuss differences in responses to the two events including availability of international aid and long-term rehousing of residents.
- Discussion about why the effects of tectonic hazards vary between areas of contrasting wealth is valid. This may focus on levels of preparedness, protection and response.
- Credit responses which argue against wealth being the controlling factor. Magnitude might be the most important factor for some events, eg Nepal earthquake magnitude was 31 times greater than Aquila.

AO1 – 3 marks
AO2 – 3 marks
AO3 – 3 marks

Spelling, punctuation and grammar (SPaG)

Responses with SPaG marks that gain a mark of 0 for the content/skills of the question can still be awarded SPaG marks if the response is judged to be a genuine attempt to answer the question.

High performance
- Learners spell and punctuate with consistent accuracy
- Learners use rules of grammar with effective control of meaning overall
- Learners use a wide range of specialist terms as appropriate.

3

Intermediate performance
- Learners spell and punctuate with considerable accuracy
- Learners use rules of grammar with general control of meaning overall
- Learners use a good range of specialist terms as appropriate.

2

Threshold performance
- Learners spell and punctuate with reasonable accuracy
- Learners use rules of grammar with some control of meaning and any errors do not significantly hinder meaning overall
- Learners use a limited range of specialist terms as appropriate.

1

No marks awarded
- The learner writes nothing
- The learner's response does not relate to the question
- The learner's achievement in SPaG does not reach the threshold performance level, for example errors in spelling, punctuation and grammar severely hinder meaning.

0

[12]

8.

Level	Marks	Description
3 (Detailed)	7–9	AO1 Demonstrates detailed knowledge of the primary and secondary effects of a tectonic hazard on people and the environment. AO2 Shows thorough geographical understanding of the interrelationships between places, environments and processes in the context of a tectonic hazard. AO3 Demonstrates application of knowledge and understanding in a coherent and reasoned way in evaluating the relative significance of primary and secondary effects on people and the environment.
2 (Clear)	4–6	AO1 Demonstrates clear knowledge of the primary and secondary effects of a tectonic hazard on people and the environment. AO2 Shows some geographical understanding of the interrelationships between places, environments and processes in the context of a tectonic hazard. AO3 Demonstrates reasonable application of knowledge and understanding in evaluating the significance of primary and secondary effects on people and the environment.
1 (Basic)	1–3	AO1 Demonstrates limited knowledge of the primary and secondary effects of a tectonic hazard on people and the environment. AO2 Shows slight geographical understanding of the interrelationships between places, environments and processes in the context of a tectonic hazard. AO3 Demonstrates limited application of knowledge and understanding in evaluating the significance of effects on people and the environment.
	0	No relevant content.

Indicative content

- The command phrase is ‘to what extent’, so the focus of the question is an evaluation of the relative importance of primary and secondary effects. There should be a discursive element which addresses whether, and to what extent, primary effects are more significant than secondary effects.

- Credit only effects (not causes or responses). Answers should refer to one of the photo images as well as a named example, although the two do not have to be balanced in coverage. The distinction should be made between primary impacts, which occur as a direct consequence of the earthquake or volcanic eruption and secondary impacts which occur as a result of the primary effects.

Earthquakes

Expect details of the event itself with data to support points.

Allow wide range of effects, e.g:

Primary effects

- Collapsing bridges and buildings; homes may be destroyed.
- Cracked and twisted roads and other damaged transport links.
- Death and injuries to individuals.
- Panic and shock of the people affected.

Secondary effects

- Fires caused by broken gas mains and electrical cables; fires develop due to the lack of water from broken pipes.
- Tidal waves or tsunamis often result from an earthquake such as the Boxing Day tsunami in 2004 or Japan 2011.
- Landslides in steep-sided valleys where the rocks are often weak.
- Shops and businesses destroyed.
- Tourists put off from visiting areas that had suffered e.g. Boxing Day tsunami.
- Damage to transport and communication links makes trade difficult.
- Disease and famine due to lack of clean water and medical facilities.
- Death caused by the cold of winter such as in the Kashmir earthquake of 2005.

Volcanic eruptions

Expect details of the event itself with data to support points.

Allow wide range of effects, e.g:

Primary effects

- The immediate impacts of volcanic gases and lava flows. Hot pyroclastic flows cause death by suffocation and burning.
- Tephra falls can cause the collapse of roofs and may destroy homes and farmland.

Secondary effects

- Lahars, landslides, and flooding. This may lead to food / water supply being interrupted.
- Disruption to travel.
- Homelessness.
- Businesses forced to close, and unemployment.
- Cost of insurance claims.
- Long-term economic issues e.g. with the tourism industry.
- Long-term impacts such as improved soils which may develop over time as the volcanic material is weathered.

AO1 = 3
AO2 = 3
AO3 = 3

Spelling, punctuation and grammar (SPaG)

High performance

- Learners spell and punctuate with consistent accuracy
- Learners use rules of grammar with effective control of meaning overall
- Learners use a wide range of specialist terms as appropriate

3

Intermediate performance

- Learners spell and punctuate with considerable accuracy
- Learners use rules of grammar with general control of meaning overall
- Learners use a good range of specialist terms as appropriate

2

Threshold performance

- Learners spell and punctuate with reasonable accuracy
- Learners use rules of grammar with some control of meaning and any errors do not significantly hinder meaning overall
- Learners use a limited range of specialist terms as appropriate

1

No marks awarded

- The learner writes nothing
- The learner's response does not relate to the question
- The learner's achievement in SPaG does not reach the threshold performance level, for example errors in spelling, punctuation and grammar severely hinder meaning

0

[12]

9.

Level	Marks	Description
3 (Detailed)	7 – 9	AO1 Demonstrates detailed knowledge of the responses to a tectonic hazard with good use of exemplification. AO2 Shows thorough geographical understanding of places, environments and processes. AO3 Demonstrates thorough application of knowledge and understanding in judging the importance of immediate and long term responses to a tectonic hazard using source and example.
2 (Clear)	4 – 6	AO1 Demonstrates clear knowledge of the responses to a tectonic hazard. AO2 Shows some geographical understanding of places, environments and processes. AO3 Demonstrates reasonable application of knowledge and understanding in judging the importance of immediate and long term responses to a tectonic hazard, using source and/or example.
1 (Basic)	1 – 3	AO1 Demonstrates limited knowledge of responses to a tectonic hazard. AO2 Shows slight geographical understanding of places, environments and processes. AO3 Demonstrates limited application of knowledge and understanding in judging the importance of immediate and/or long term responses to a tectonic hazard, using source and/or example.
	0	No relevant content.

- **Level 3** (detailed) responses will be developed and include both immediate and long term responses to a tectonic hazard (some may be interlinked).
  Responses are related to a named example and the photographs, with some assessment.
- **Level 2** (clear) responses are likely to have linked statements, with some accurate use of geographical terms. May refer to named example. May start to evaluate responses. Uses source and/or example.
- **Level 1** (basic) responses are likely to consist of simple statements, with very limited use of subject vocabulary. May be limited to generic statements. May be limited to a single type of response. Uses source and/or example.
- Reject discussion of impacts unless directly related to responses.
- A purely generic answer without clear exemplification is limited to Level 2.
- An answer that lacks consideration of the relative importance of immediate and longer term responses is limited to Level 2.
- An answer that refers only to responses to tropical storms or other non-tectonic disaster is limited to L1, but answer can access L2 if knowledge and understanding is applied appropriately to the source.

Indicative content

- The command is “do you agree” and to “explain your answer”, so the focus of the question is an evaluation of the degree to which long term responses are more or less important than responses in the short term. e.g. Fully agree, disagree, partially agree. Many may feel that short term responses are more significant. Answers should consider their relative importance, supported by evidence.
- Credit only responses (not causes or effects). Answers should refer to a named example, although general answers are creditworthy to the top of Level 2. Examples can include named volcanic events, earthquakes, tsunamis and other hazards. Answers may include just one exemplar but credit can be given for others if relevant. They may make distinctions between responses in HIC and LICs/NEE countries.
- Understanding of immediate responses, i.e. the first/emergency actions taken by people after an event. These include the need to search for and rescue people, getting them to safety or to hospital, possibly moving inland or to higher ground if a tsunami; a need to try to provide medical help, to ensure there is clean water (and food); a need to bury the dead, often in mass graves to stop the spread of disease. All of this may require international aid with teams of sniffer dogs, heavy equipment, medical staff, provisions of water purifying tablets, blankets, setting up shelters, tents etc.
- Long-term responses are responses by people that occur over weeks, months or years. These involve the need to rebuild houses, ideally using different materials and designs, to make them less easy to destroy, and to rebuild public buildings and infrastructure. There may be a requirement to rebuild roads and railways; to ensure jobs are being created; to help people to come to terms with a traumatic event and loss of parents and children; to predict and prepare for future events and introduce measures to reduce the effects of future hazards.
- Evaluation of the photographs. Allow any reasonable inference from the photographs. Immediate responses include providing water supplies, medicines, first aid and essential supplies for survival. Long term responses involve rebuilding programmes, constructing new houses using strong long-lasting materials, replacing those that were destroyed. This allows people to plan for the future, and may also provide work for local builders, electricians, carpenters etc.
- Knowledge and understanding of specific example(s) of a tectonic event(s) e.g. Haiti 2010. Many countries responded to appeals for aid, dispatching rescue and medical teams, engineers and support personnel. Communication systems, air, land, and sea transport facilities, hospitals, and electrical networks had been damaged by the earthquake, which slowed rescue and aid efforts. As rescues tailed off, supplies, medical care and sanitation became priorities. There were delays in aid distribution. Looting and sporadic violence occurred. Medicines San Frontiers tried to help casualties whilst the USA took charge of trying to coordinate aid distribution.

- Longer term responses. The EU and World Bank provided longer term assistance but response was slow. Huge increase in number of people in relief camps of tents, most with no electricity, running water, or sewage disposal. The Dominican Republic offered support and accepted some refugees. Most debris has now been removed, new building codes have been established, port is being rebuilt, part of the country's debt has been written off and most agencies are resolved to make sure that the recovery is sustainable.
- Evaluation of the relative importance of immediate and long term responses. Both may be considered essential, although longer term responses are sometimes given lower priority after initial publicity ceases. Immediate relief is essential to save lives, provide shelter and food. Short term aid from other countries may be crucial as government is not able to meet the needs of the victims. Long term responses may be considered equally/more important as they ensure the survivors are able to integrate back to their normal life. Length of recovery period may depend on availability of money for longer term reconstruction, available technology, efficiency of distribution systems, communications and infrastructure, level of preparation and planning, and how well emergency services cope.

AO1 = 3
AO2 = 3
AO3 = 3

Spelling, punctuation and grammar (SPaG)

High performance
- Learners spell and punctuate with consistent accuracy
- Learners use rules of grammar with effective control of meaning overall
- Learners use a wide range of specialist terms as appropriate.

3

Intermediate performance
- Learners spell and punctuate with considerable accuracy
- Learners use rules of grammar with general control of meaning overall
- Learners use a good range of specialist terms as appropriate.

2

Threshold performance
- Learners spell and punctuate with reasonable accuracy
- Learners use rules of grammar with some control of meaning and any errors do not significantly hinder meaning overall
- Learners use a limited range of specialist terms as appropriate.

1

No marks awarded
- The learner writes nothing
- The learner's response does not relate to the question
- The learner's achievement in SPaG does not reach the threshold performance level, for example errors in spelling, punctuation and grammar severely hinder meaning.

0

[12]